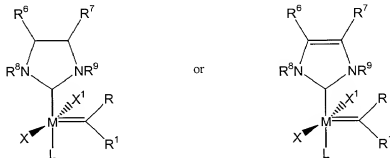


ABSTRACT

The invention is directed to the cross-metathesis and ring-closing metathesis reactions between geminal disubstituted olefins and terminal olefins, wherein the reaction employs a Ruthenium or Osmium metal carbene complex. Specifically, the invention relates to the synthesis of α -functionalized or unfunctionalized olefins via intermolecular cross-metathesis and intramolecular ring-closing metathesis using a ruthenium alkylidene complex. The catalysts preferably used in the invention are of the general formula



wherein:

M is ruthenium or osmium;

X and X¹ are each independently an anionic ligand;

L is a neutral electron donor ligand; and,

R, R¹, R⁶, R⁷, R⁸, and R⁹ are each independently hydrogen or a substituent selected from the group consisting of C₁-C₂₀ alkyl, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, aryl, C₁-C₂₀ carboxylate, C₁-C₂₀ alkoxy, C₂-C₂₀ alkenyloxy, C₂-C₂₀ alkynyloxy, aryloxy, C₂-C₂₀ alkoxycarbonyl, C₁-C₂₀ alkylthio, C₁-C₂₀ alkylsulfonyl and C₁-C₂₀ alkylsulfinyl.